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A Social and Economic Analysis of Professional Regulation in Optometry

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National Center for Health Services Research
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Abstract

Two major issues are addressed, using the occupation of optometry as a case: (1) how is professional regulatory power gained by a health occupation?, and (2) what are the costs and benefits of professional regulation to the public? We find that political resources are important in determining the degree of professional regulation achieved by optometry. For instance, optometry is more likely to achieve its regulatory goals where its size relative to other vision care occupations is high and in states with less competitive party systems, less innovative legislatures, and higher turnover of legislators. Four professional regulations raise the average price of an eye examination by 32%, controlling for characteristics of the services provided. Regulations lower the marginal prices for extra quality, but extra quality produced in restrictive states is not valued as highly as its social cost. This results in a welfare loss from excess optometric examination length and procedures, causing a welfare loss to society of about $8 million annually. In addition, the higher prices due to regulation cause a transfer of wealth from consumers to optometrists of about $140 million annually.

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A Social and Economic Analysis of Professional Regulation in Optometry

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October 1980

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Office of Health Research, Statistics, and Technology
National Center for Health Services Research

DHHS Publication No. (PHS) 80-3285

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This *NCHSR Research Digest* was prepared by the principal investigators, James W. Begun, of the Department of Community Medicine and Hospital Administration, University of North Carolina; and Roger D. Feldman, Center for Health Services Research, University of Minnesota. The study was supported by the National Center for Health Services Research through grant no. HS 03085. Lih Y. Young, project officer, NCHSR, made monitoring and editorial contributions.

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Foreword

Controversy exists over the desirability of professional regulation. Some argue that regulation serves the public interest by assuring quality. Others argue that regulation serves only the self-interests of the regulated professionals. Despite this controversy, few empirical studies have examined the process of gaining self-regulation or its impacts on costs and/or benefits to the public. This report presents the results of a unique examination of a self-regulated health profession-optometry. In-depth case studies of four states (Texas, Florida, Maryland and North Carolina) with varying levels of professional dominance are used for the analysis. In addition, data from 48 states were used to empirically test public-interest and self-interest models of the demand for regulation. Several impacts of regulation, as related to this profession were examined. These include restriction of commercial practice by optometrists, restriction of price advertising by optometrists and opticians and continuing education linked to licensing.

The economic approach allows quantification of the impact of regulation on the price-quality relationship. The economic effects of professional regulation, including the costs and benefits, were estimated. More specifically, the cost to consumers, monopoly profits gained by optometrists and the change in quality levels were investigated. The findings of the authors confirm assertions that professional regulation does, in fact, inhibit competition and increase costs. Since competition, and the means to promote competition are receiving increasing emphasis, this study is not only original and timely, it can serve as a model for future research.

Gerald Rosenthal, Ph.D.
Director
October 1980

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Introduction

The debate over professional regulation

The health care professions in the United States exist in a largely non-competitive environment which promotes higher prices and restricted access to services. A major reason for the absence of competition within and among the health professions is the structure of professional regulation. Professional associations and state licensing boards are the primary agents of professional regulation, but often they are dominated and used by the professions they are authorized to regulate. Belated recognition of this fact has led federal and state governments to overturn certain anti-competitive regulations and to investigate the continuing need for others. State sunset commissions, the Council of State Governments, the Federal Trade Commission, Department of Labor, Justice Department, and the Department of Health and Human Services, formerly the Department of Health, Education, and Welfare all have been active in supporting the reform of state laws regulating the health professions. For example, the Federal Trade Commission has actively sought to overturn advertising restrictions in state laws regulating pharmacists, physicians, optometrists, and dentists.

Even as policy-makers reassess the consequences of professional regulation, social scientists have given increased attention to this issue. Sociologists have studied the effects of licensure and other regulatory decisions on occupational growth and development, while political scientists have shown renewed interests in the process of regulatory policy-making. Finally, the costs and benefits of professional regulation have been the subject of research by health economists.

While the multi-disciplinary research on regulation addresses slightly different issues, the central theoretical arguments are strikingly similar. In all three disciplines a "self interest" model of professionalism has emerged, which asserts that professions seek regulation to protect and enhance

their status, income, and power. This challenge to the traditional image of professions can be contrasted to a "public interest" model of regulation. According to the latter, professional regulation is necessary to protect the public welfare. Moreover, self-regulation raises the quality of services, a benefit presumed to outweigh any possible adverse consequences.

A study of professional regulation in optometry

The research questions addressed by this study include the following two: (1) how is professional regulatory power gained by a health occupation? and (2) what are the costs and benefits of professional regulation to the public? The first issue is the subject of a case study of one health occupation, optometry, in four states; the results are then used to construct and test a casual model of optometry's regulatory success in 48 states. Finally, national survey data on optometric practice are used to examine the costs and benefits of selected optometric regulations. Each of the three analyses is discussed separately below.

Optometry was chosen to be representative of the many other occupations that have gone or are going through the process of professionalization. The rapid growth of professionalizing occupations is characteristic of the field of health care delivery, as the number of specialized health occupations has multiplied with the expansion of health care knowledge and technology. As noted above, consumers and policy-makers are beginning to view with suspicion many of the restrictions promulgated by the self-regulated occupations. In particular, potentially anti-competitive restrictions in optometry and the other vision care occupations have been the subject of an on-going investigation by the Federal Trade Commission.

The profession of optometry

In the United States, optometry is one of three occupations responsible for vision care; the others are ophthalmology and opticianry. *Ophthalmologists* (also known as oculists) are physicians (M.D.s) who specialize in the diagnosis and treatment of eye diseases and other abnormal conditions; they may prescribe drugs, lenses, and other forms of treatment, as well as perform surgery. *Optometrists* (O.D.s) perform vision exam-

inations to determine visual strengths and weaknesses, and they are able to prescribe lenses, other optical aids, or visual training when appropriate. Recently they have been allowed to prescribe drugs in some states, but they may not perform surgery. Optometrists refer cases of eye diseases to ophthalmologists. *Opticians* grind lenses based on a prescription from an ophthalmologist or optometrist, and they fit eyeglass lenses into frames and adjust the frames to the wearer. Opticians may not examine eyes or prescribe treatment. In 1974 active optometrists outnumbered ophthalmologists by some 19,400 to 10,700, while there were about 11,000 opticians in the United States.

Today the economic success of optometrists approaches that of dentists and physicians, and more and more optometrists are coming to be accepted by those two occupations as equals in the elite of health occupations. This situation is remarkable in light of the fact that at the turn of the century optometry was only an idea in the minds of some opticians who were dissatisfied with their place in the occupational structure. The rise of optometry was accompanied by numerous struggles in state legislatures between "professional" optometrists and their opposition, as the former sought to change optometry into a more "professional" occupation. The case study described next examined some of those struggles.

A case study of the politics of professional regulation

Methods

The case study analyzed the process by which professional optometry has interacted which state political systems to pursue regulatory goals in North Carolina, Florida, Texas, and Maryland. We concentrated on two professional regulation issues in optometry in the four case study states—commercial activity restrictions, and controls over diagnostic drug use by optometrists. Commercial activity restrictions, which have been controversial in the development of optometry, include bans on price advertising and on employment of optometrists by corporations. Optometrists have recently gained the right to use diagnostic and/or therapeutic drugs in twenty states, providing the second issue for the study of how optometry has sought its policy goals.

Data for the study come from three major sources: documents, interviews, and questionnaire surveys. The sources as well as their strengths and weaknesses are detailed below.

1. Documentary Evidence. Since optometry is a relatively new occupation in the U.S. (post-1900), much of the original "in-house" description of its growth does exist in written form. The International Library, Archives and Museum of Optometry in St. Louis cooperated in providing access to much of that material, such as state and regional journals and newsletters from back into the early 1900's. National journals and publications of the American Optometric Association also were pursued for references to the topics and case states under study, together with published histories of optometry and the American Optometric Association.

Visits to state government libraries in each of the four case states were carried out in order to obtain copies of legislative bills relating to optometry and to trace the history of those bills. In general, however, records, of state legislative proceedings prior to the 1960's are very poor, so in some cases

historical information was gathered from newspaper accounts of legislative proceedings. Selected court cases involving optometry were traced in the state government libraries.

In late 1975 the Federal Trade Commission proposed a trade regulation rule that would lift price advertising restrictions on ophthalmic goods. The FTC conducted public hearings and collected comments and documents during 1976–77, and a rule eventually was passed in 1978. We examined the more than 30,000 pages of comments and hearings testimony for relevant material. Some 21 entries and 114 letters from consumers related to Florida; 48 entries and 24 letters to Texas; 12 entries and 8 letters to North Carolina; and 4 entries and 17 letters to Maryland.

Finally, some pieces of documentary evidence were submitted by interview subjects at our request; for example, association and government agency representatives often were asked for annual reports, public relations releases, etc.

2. Interviews. Semi-structured interviews were conducted in 1977 and 1978 with 67 "special respondents." As defined by Gorden, special respondents are interviewees who were selected because they were able to give information directly relevant to the study objectives. The specific interview instruments varied depending on the interviewees and their roles. Generally, our interviews lasted about one hour and later were summarized in writing from detailed notes taken during the interviews. Very few of the interviews were tape-recorded because of the sensitivity of some of the topics.

All respondents were promised anonymity. Therefore their exact positions have been altered slightly in the discussion which follows. We also arbitrarily alternate gender in the use of the pronouns "he" and "she" and adjectives "his" and "her."

Respondents typically fell into one of three major groups: state legislators (28), optometrists (20), and physicians (11). Others included optical industry business people and opticians (5), and consumer group representatives (3). Three of the optometry respondents were lobbyists who were not members of the occupation, as were two of the physician respondents and one of the optician respondents. Of the total number of respondents, 22 were in North Carolina, 19 in Maryland, 13 in Florida, and 13 in Texas. Fewer persons

were interviewed in Florida and Texas, the last two states studied, because of financial resource constraints.

Respondent cooperation was very high. Only three refusals to be interviewed were encountered, and respondents generally were open and interested in the topics discussed. Several (roughly one-fourth) requested a copy of the results of the research.

3. Questionnaire surveys. One of the authors conducted a mail questionnaire survey of optometrists in the four case study states between November 13, 1976 and February 3, 1977. A sample of 717 optometrists in the four states was systematically selected from alphabetical listings of licensed optometrists provided by the four state optometric licensing boards. To achieve a return of approximately 100 questionnaires in each state, sampling proportions varied as follows: Texas = .20; North Carolina = .50; Florida = .25; Maryland = .67. Two mailings of the questionnaire with a cover letter were conducted, followed by a third mailing of a letter and postcard. A total usable response rate of 62% was obtained.

The questionnaire consisted of sixty-nine questions. The first section of the questionnaire solicited opinions about various issues in the professional development of optometry. A second section was devoted to behavioral indicators of professionalism, including journal subscription, continuing education, and organizational involvement. Information on personal background and patient characteristics was then requested. Finally a series of questions sought information on practice characteristics. These included questions on the price of materials and services, and indicators of practice quality.

The states of North Carolina, Florida, Texas, and Maryland were selected because they vary substantially in the degree of regulatory success achieved by professional optometry. Optometry's efforts have been highly successful in North Carolina and Florida, although recently in Florida opposing interest groups have been gaining power. Optometry has been much less successful in Texas and Maryland, although in Texas professional optometry has shown signs of increasing strength.

The political environment of state regulatory policy

Based on our study of the political conflicts over drug use and commercial practice regulations in all four states, the political environment can be depicted in general terms as follows: In all of these regulatory controversies, competing groups are few in number and strong in commitment. They consist of the professional and commercial segments of the occupation, economic competitors, and client groups. The professional segment is represented by the state professional association and has no allies among the competing groups. The arena for political activity is the state legislature. Legislators receive most of their information from the competing groups and dislike the issues because they are volatile and often esoteric. Because of the high degree of commitment of the involved interest groups, political compromises are difficult to achieve. The issues receive little public attention and political parties are unimportant in the controversies.

Rarely are consumer interests directly represented in the political arena. Interest group activity determines outcomes of policy decisions, and in only one instance (senior citizens in Florida) were consumers sufficiently concentrated to cause mobilization of an effective consumer interest group.

As noted above, a limited number of interest groups are involved politically. There were only two major combatants in the battles over drug use—professional optometry and medicine. The major participants in each state in the commercial practice conflicts were the professional and commercial segments within optometry. Allied with commercial optometry were businesses that employ optometrists or sell eyeglasses, newspaper publishers who benefit from advertising, and client groups interested in introducing more competition into the market. It is notable that in no instance did professional optometry have a major ally in its legislative battles—it functioned on its own in the political environment.

The political effectiveness of professional optometry

The political organization that channels demands for changes in regulatory policy into the political system is the state professional association. In the four case study states, the professional associations wrote and promoted the original licensing laws as well as commercial activity and drug use proposals that followed. In all four states, the professional associations

served as the political mobilizing arm of optometry by coordinating political strategies, lobbying efforts, and legislative testimony. The professional associations employed lobbyists and were politically active and astute.

In the states where professional optometry has been most successful in achieving its regulatory goals, the profession is particularly well-organized and involved in political activity. In North Carolina, for example, passage of drug use legislation was preceded by an intense campaign in which the state was divided into sections that were assigned district leaders; in turn these district leaders monitored optometrist-legislator contacts. Furthermore, the campaign was conducted in an election year, all candidates for the legislature were contacted, and they were supplied with information regarding the drug use legislation. At the local level, optometrists participated in the campaigns of many state legislators, developed social contacts with candidates, and generally made themselves familiar to the legislators. In addition, optometry contributed heavily to the primary and general election campaigns of candidates to both houses of the state legislature.

In explaining optometry's varying success in the four states, we also found that internal segmentation of optometry reduced its political effectiveness, while size, geographic distribution, income, social status, and leadership resources aided optometry's efforts to secure professional regulations. But these factors did not guarantee political success, because they are all relative to similar characteristics of opposing groups. Thus the presence and political participation of opposing groups was important. In two of the states, Maryland and Texas, professional optometry faced significant opposition to most of its political goals; in Florida, some opposition was present; and in North Carolina, opponents were few and relatively weak. We found that the following hypothesis best explains why variation in the political opposition to optometry exists:

> The greater the degree to which other groups perceive their economic interests to be affected by the policy goals of the professionalizing occupation, the greater the degree to which other groups will participate in the political environment.

Evidence from the four states indicated that ophthalmology's opposition to drug use by optometry varied with the degree to which ophthalmology perceived its economic inter-

ests to be affected by professional optometry's efforts to expand. For instance, we suggest that ophthalmology's weak resistance to optometry in North Carolina was due to the low degree of economic competition between ophthalmologists and optometrists, while potent opposition by ophthalmology in Maryland reflects the most competitive vision services market there. Similarly, political opposition from commercial interests to optometry's professionalizing movement was highest in Texas and Maryland, where more commercial competitors historically have been present. In turn, the presence of political opponents to professional optometry was found to be related to the degree of urbanization of the state. Urbanization leads to the growth of high volume practices and businesses, whose owners resist restrictions on commercial activity. Also, urban areas are more likely to harbor the specialized occupations whose economic survival is threatened by the definition of a work domain by a newly professionalizing occupation.

A more systematic study of state regulatory policies

Methods

Explanation of the variable degree of professional regulation in optometry was next addressed through empirical analysis of state-level data on optometric regulations, interest groups and political system characteristics, and socio-economic environment. Results of the case study as well as relevant literature, mainly from political science, were drawn upon to construct an explanatory model of the regulatory success of optometry in 48 states.

Explanatory variables in the analysis included the urbanization and per capita income of each state, inter-party competition, legislative turnover, and innovativeness in policymaking. In addition, three measures of optometric group power were used: the percent of optometrists belonging to their state's professional organization, the ratio of optometrists to ophthalmologists and opticians, and whether or not the professional association employed a legislative lobbyist. The dependent variable, degree of regulations of optometry, was an index composed of four practice standard regulations. The regulations are those governing price advertising, branch offices, commercial practice, and continuing education.

Explaining cross-state differences in the degree of regulation of optometry

The independent variables explained one-third of the variation in the regulation scale across states. The earlier case study suggested that the political resources of a professionalizing occupation relative to its economic rivals have a significant effect on its ability to gain professional regulation, and the causal model confirmed this finding—the strongest explanatory component in the model was the state-level ratio of optometrists to ophthalmologists and opticians. Where

optometrists have a greater edge in raw numbers over their economic competitors, they have greater success in achieving regulatory policies which promote professionalism.

The regression analysis results also revealed that political measures influence the degree of regulation of optometry. We found that inter-party competition and state policy innovativeness were inversely related to the level of professional regulation obtained by optometry. One implication of this finding is that greater inter-party competition and legislative innovativeness constrain the power of interest groups. This is important in light of the fact that consumer interests are under-represented in regulatory decision-making. The findings suggest that elected officials generally will be responsive to consumer interests only to the extent that they feel compelled to compete for votes with another party. In a less competitive situation, politicians have fewer incentives to resist the pressure of organized interest groups.

We also found that legislatures with high turnover rates were more likely to allow high levels of self-regulation by optometry. Frequent turnover may characterize a legislature whose members have less expertise in substantive matters. These relatively inexperienced legislators are more likely to rely on interest group lobbyists for their knowledge. Frequent turnover also reduces the likelihood that effective oversight of policy programs will be carried out and interest group demands challenged.

In summary, the causal analysis of state regulatory policy supports the argument that regulation is actively sought by professionalizing occupations. As shown in the case study, these groups enter the political arena to secure their regulatory objectives, and their success in obtaining these goals depends on organizational resources and on the political environment of the states.

The consequences of professional regulation: an economic analysis

The last phase of this study of professional regulation in optometry investigated the consequences of regulatory politics. Generally, we examined the separate impact of each of the regulations included in the scale of optometric regulation used above. In addition, we examined several different measures of advertising restrictions on ophthalmic goods and services because of the importance of the advertising effect issue in the policy arena and in the discipline of economics. The source of data was a 1976–77 national questionnaire survey of a sample of over 1,000 optometrists. Variables used for our empirical estimations are provided in Table 1, including mean values and standard deviations.

Do regulations raise prices?

Using ordinary least-squares regression, we analyzed variation in the price of optometric examinations as a function of examination quality (length and complexity), characteristics of the optometrist and the optometrist's practice, and the presence or absence of each of four state regulations. The results are shown in Table 2. The total effect of all four bans is to increase price by 32 percent. Considered separately, commercial practice bans raise price by about 5 percent, advertising bans by 9 percent, branch office bans by 2 percent, and continuing education requirements by 13 percent. The coefficient for branch office bans is statistically insignificant.

The effect of advertising bans on the mean and variance of price

Several analyses were conducted solely of the consequences of advertising bans on optometrists and opticians for the price of optometric eye examinations. Columns 1 and 2 of Table 3 report the results of ordinary least squares regressions using two different methods of categorizing advertising

bans. The Type 2 classification of state advertising bans is more inclusive, that is, it is easier for states to be classified as restrictive. For both Type 1 and Type 2 definitions, states were classified as having "strict" bans if restrictions governing

Table 1. Glossary of variables

Variable	*Mean*	*Std. Dev.*
Natural log of charge for complete examination of presbyopic patient (ln price)	3.1473	.3094
Length of presbyopic examination in minutes (length)	33.3345	9.9387
Examination procedures, 1–8 scale (procedure)	4.3284	1.5577
Office equipment, 0–6 scale (equipment)	4.0569	1.4354
Continuing education hours, 1976 (continuing education)	21.5082	13.9200
Journals received 0–4 scale (journals)	2.6056	.9840
Years Practiced (years practiced)	21.1331	12.0216
Number of examining rooms per visit used by this optometrist (rooms/visit)	.0015	.0016
Percent of time in specialty practice (specialty %)	19.9380	17.0304
Examinations per week (exams/week)	33.9435	18.5969
Annual patient care hours, 1000s (annual hours)	1.856	.396
Square of years practiced (years practiced^2)	594.1523	557.6578
County average salary, offices of physicians, laboratories, and accounting firms, $1000s, 1972 (salary)	2.1871	.1928
County population, millions, 1970 (population)	.935	1.780
County optometrists (1972–73) per 1000 population (ODS/capita)	.0976	.0428
County percent urban, 1970 (urban %)	73.6772	24.6564
Optometrist or optician price advertising banned (moderate ban–1)	.7556	.4299
Optometrist and optician price advertising banned (strict ban–1)	.2393	.4269
Optometrist or optician price advertising banned, inclusive definition (moderate ban–2)	.8201	.3483
Optometrist and optician price advertising banned, inclusive definition (strict ban–2)	.3079	.4618

Table 2. Price of an optometric examination as a function of quality and professional regulations

Variable*	Coefficient	T-value
ln PRICE = dependent variable		
Exam length	.00670	8.14
Exam procedures	.0168	3.01
Office equipment	.0500	8.34
Continuing education hours taken	.00222	4.05
Journals received	.0195	2.56
Years practiced	.00791	4.06
Examining rooms/visit	9.530	1.94
Specialty%	.00126	2.78
Exams/week	-.00304	6.97
Annual patient care hours	-.0656	3.51
Years practiced^2	-.000195	4.65
Strict advertising ban (type 2)	.0852	5.35
Commercial practice ban	.0488	2.78
Branch office ban	.0187	1.06
Continuing education requirement	.121	5.85
Constant	2.517	
R^{-2}	.430	

both opticians *and* optometrists were present and as having "moderate" bans if either was present. The influence of the advertising bans on price ranges from statistically insignificant effects of −3% and −1% for the moderate bans to statistically significant effects of +15% and +11% for the strict advertising bans.

Next, we tested the hypothesis derived from consumer search theory that price advertising bans result in higher price variance, by comparing three subsamples of states—those that permit price advertising by both optometrists and opticians, those prohibiting advertising by either optometrists or opticians, and those with both bans. The mean square errors of price in permissive, moderate, and strict states are .04413, .0539, and .06964, respectively, and the differences are statistically significant at $p < .05$. Therefore, the data support the hypothesis that bans on price advertising raise the variance of prices.

For statistical reasons, we re-estimated the effect of the advertising ban using generalized least squares analysis, and the results (using the Type 2 advertising ban definition) are

given in column 3 of Table 3. The key policy implication is that the presence of advertising bans on opticians and optometrists raises the price of an eye examination by 11 percent relative to permissive states. A 1978 FTC ruling removes price advertising restrictions on both opticians and optometrists; the affected restrictions correspond most closely with our Type 2 (more inclusive) definition of advertising restrictions. We may infer that the effect of the FTC ruling will be to lower by 11 percent the average price charged by optometrists for vision examinations. At a mean price of $23.27 (in 1976) the savings to consumers may be about $2.50 per examination.

The effect of regulations on consumer demand for quality

State licensing regulations may also influence the price and consumption of units of the *quality* of professional goods and services. Hence, it is informative to examine demand equations for measures of service quality, in this case the length and complexity of eye examinations. It first was necessary to estimate the marginal prices of the quality measures, by regressing price on quality. Marginal prices of quality were found to be significantly lower in regulated states; that is, although eye examinations are more expensive in regulated

Table 3. Price of an optometric examination as a function of quality and advertising bans

Variable*	Type 1 definitions		Type 2 Definitions		GLS analysis, Type 2 Definitions	
	Coefficient	T-Value	Coefficient	T-Value	Coefficient	T-Value
ln price = dependent variable						
Exam length	.00671	8.33	.00689	8.30	.00679	8.23
Exam procedures	.0187	3.44	.0210	3.75	.0215	3.89
Office equipment	.0501	8.54	.0529	8.78	.0497	8.30
Continuing education hrs.	.00230	4.27	.00233	4.22	.00241	4.37
Journals received	.0188	2.54	.0173	2.26	.0186	2.47
Years practiced	.00803	4.22	.00830	4.23	.00855	4.39
Examining rooms/ visit	10.276	2.13	8.004	1.61	4.02	.71
Specialty %	.00112	2.52	.00115	2.52	.00122	2.65
Exams/week	−.00291	6.78	−.00321	7.29	−.00329	7.39
Annual patient care hours	−.0665	3.63	−.0706	3.74	−.0735	3.89
Years practiced^2	−.000199	4.86	−.000205	4.86	−.000206	4.92
Moderate advg. ban	−.0306	1.81	.00577	.30	.00557	.32
Strict advg. ban	.174	10.21	.0885	5.52	.0866	5.08
Constant	2.656		2.636		2.653	
$\bar{R}^2$	.430		.395		.597	

*See Table 1.

states, it is relatively cheaper to buy another unit of "quality," such as another minute of examination length or another procedure.

The demand equations for quality, estimated by ordinary least squares and Zellner's procedure for estimating seemingly unrelated regressions (SUR), are illustrated in Table 4. The table shows that own-price elasticities of demand are negative, as predicted by economic theory, and the cross-price coefficients indicate that examination length and procedures are complementary goods.

The welfare cost of quality changes

A major argument for professional regulation rests upon the assertion that such control results in improved quality and thus protects the consumer. This in turn is used to justify the relatively higher prices charged in areas of strong regulation. The results of this investigation, shown in Table 4, support this argument in that they show that longer examinations and more procedures are demanded in the more regulated States. This is because the effect of regulation is to reduce the marginal price (the price of one additional unit of service) below its marginal cost. Thus, the production of additional services is relatively cheap. Under conditions of pure competition, the marginal price of producing a given level of quality is equal to its marginal cost. Since professional regulations are a departure from the norm of pure competition, we may infer that eye examination length and procedures are priced below marginal cost in regulated states. Survival of producers in these states is possible because regulations raise the price of an eye examination. Put another way, eye examinations are very expensive in regulated states but it is relatively cheap to buy another minute of examination length or another procedure.

How does this pricing system affect the consumer? Pricing quality below its marginal cost leads society to devote too many resources to producing quality, in the sense that extra quality produced in restrictive states is not valued as highly as its social cost. This results in a welfare loss, (The diversion of resources from more economically efficient uses) from excess optometric examination length and procedures that can be calculated by multiplying the average welfare cost per examination in states with one or more regulations by the number of vision examinations in those states. This computation

Table 4. Demand equations for optometric examination length and procedures*

Independent variables	Dependent variable: Length				Dependent variable: Procedures			
	SUR		OLS		SUR		OLS	
	Coefficient	T-Value	Coefficient	T-Value	Coefficient	T-Value	Coefficient	T-Value
$\partial\hat{P}/\partial$ Length (price of length)	−17.383	2.80	−18.043	2.93	−4.022	4.18	−3.865	4.03
$\partial\hat{P}/\partial$ Procedures (price of procedures)	−2.752	1.75	−3.110	1.81	−.659	2.43	−.736	2.76
% of patients white	.0761	4.39	.0783	4.51	.00826	3.07	.00890	3.30
Third party coverage %	.0371	1.61	.0342	1.53	.0119	3.33	.0117	3.37
Medicaid %	.0166	.59	.0168	.60	.00999	2.28	.00910	2.09
Income of patient	.718	1.26	.674	1.19	.304	3.43	.302	3.43
Constant	31.964		32.382		4.481		4.463	
$\bar{R}^2$			.0313				.0465	

*See Table 1 for variables.

yields an estimate of $8 million as the welfare loss from excess examination quality in regulated states in 1976.

Finally in this regard, the study analyzed the monopoly income transfer due to the commercial practice, continuing education, and advertising regulations in optometry. As we have seen, consumers in restrictive (heavily regulated) states pay higher prices for eye examinations; this means that consumers are transferring resources to producers. But how great are the benefits of regulations to optometrists? We calculated this figure by multiplying the additional cost per examination due to each regulation by the annual number of examinations in regulated states. The total annual value of the income transfer induced by the three regulations is $139.5 million.

We hypothesize that reduced prices for extra length and for extra procedures in regulated states are due to quality competition. It is a widely held view that regulation confers market power on a profession. The profession limits entry, mobility, and competition; consequently, the market is restricted and prices rise. Professional and legal sanctions prevent would-be price cutters from expanding their share of the market. But cutting the price of quality is much harder to detect; therefore, quality competition is used to attract customers in a monopolized profession.

This explanation is consistent with high basic examination prices and low quality prices in the optometric profession. Bans on commercial practice and branch office practice reduce competition, and advertisement bans restrict consumers' access to price information. The results are quality competition, welfare costs to consumers, and resources transferred to the profession.

Conclusions and recommendations

At issue here has been the public interest model of regulation, and in particular its assertion that professional regulation is necessary to protect the public welfare. Proponents of this argument have claimed that professions seek autonomy in order to better serve the public at large. In this view, regulation enhances the quality of services, a benefit presumed to outweigh any possible adverse consequences.

This perspective has been challenged by advocates of a self-interest theory of the regulatory process, which asserts that professions actively seek regulation to protect and add to their status, power, and income. These conflicting arguments were tested by analyzing how professional regulatory power is gained by an occupation, and scrutinizing the costs and benefits of professional regulations to consumers.

We found strong support for the self-interest or economic theory of regulation. Not only is the growth of professional regulation a political process, but the socioeconomic and political resources of professionalizing occupations determine their success in obtaining favorable regulatory outcomes. These factors are contrained somewhat by political system and environmental characteristics.

Although we did find that regulation is associated with higher quality in service delivery (as measured by examination length and procedures employed), the increased quality may not be valued by consumers at its marginal cost. Apparently, the regulated occupation actively seeks regulations to enhance its status, income and power, even as these anti-competitive regulations have adverse consequences for consumers.

This research supports the need for continued investigation of restrictions on practice developed by the self-regulated occupations. Occupation-specific studies of the effects of regulations on price, quality, and other outcomes are

needed. Future research would be improved by better measures of regulations and multiple indicators of the quality of services, including outcome and consumer satisfaction measures.

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BIBLIOGRAPHIC DATA SHEET	1. Report No. NCHSR 80-51	2.	3. Recipient's Accession No.
4. Title and Subtitle A SOCIAL AND ECONOMIC ANALYSIS OF PROFESSIONAL REGULATION IN OPTOMETRY; NCHSR RESEARCH DIGEST SERIES			5. Report Date October 1980 6.
7. Author(s) James W. Begun, Roger D. Feldman			8. Performing Organization Rept. No.
9. Performing Organization Name and Address Department of Community Medicine and Hospital Administration University of North Carolina Chapel Hill, North Carolina 27514			10. Project/Task/Work Unit No. 11. Contract/Grant No. HS 03085
12. Sponsoring Organization Name and Address DHHS, PHS, OHRST, National Center for Health Services Research Publications and Information Branch, Room 7-44 3700 East-West Highway Hyattsville, MD 20782 (Tel.: AC 301/436-8970)			13. Type of Report & Period Covered 7/1/78 - 8/31/79 14.
15. Supplementary Notes DHHS Publication No. (PHS) 80-3285.			

16. Abstracts

Two major issues are addressed, using the occupation of optometry as a case: (1) how is professional regulatory power gained by a health occupation?, and (2) what are the costs and benefits of professional regulation to the public? We find that political resources are important in determining the degree of professional regulation achieved by optometry. For instance, optometry is more likely to achieve its regulatory goals where its size relative to other vision care occupations is high and in states with less competitive party systems, less innovative legislatures, and higher turnover of legislators. Four professional regulations raise the average price of an eye examination by 32 percent, controlling for characteristics of the services provided. Regulations lower the marginal prices for extra quality, but extra quality produced in restrictive states is not valued as highly as its social cost. This results in a welfare loss from excess optometric examination length and procedures, causing a welfare loss to society of about $8 million annually. In addition, the higher prices due to regulation cause a transfer of wealth from consumers to optometrists of about $140 million annually.

NCHSR publication of research findings does not necessarily represent approval or official endorsement by the National Center for Health Services Research or the U.S. Department of Health and Human Services.

Lih Y. Young, Ph.D., NCHSR P.O.; AC 301/436-8943.

17a. Descriptors

17b. Identifiers/Open-Ended Terms

Health services research
Regulation in Optometry
Social and economic analysis of professional regulation in optometry

17c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
Releasable to the public. Available from National Technical Information Service, Springfield, VA (Tel.: AC 703/487-4650)	UNCLASSIFIED	30
	20. Security Class (This Page) UNCLASSIFIED	22. Price

FORM NTIS-35 (REV. 10-73) ENDORSED BY ANSI AND UNESCO. THIS FORM MAY BE REPRODUCED USCOMM-DC 8265-P74

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HHS 396

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DHHS Publication No. (PHS) 80-3285